SAFETY PRECAUTIONS

SERVICE WARNING

Only qualified service technicians who are familiar with safety checks and guidelines should perform service work. Before replacing parts, disconnect power source to protect electrostatically sensitive parts. Do not attempt to modify any circuit unless so recommended by the manufacturer. When servicing the receiver, use an isolation transformer between the line cord and power receptacle.

SERVICING THE HIGH VOLTAGE AND CRT

Use EXTREME CAUTION when servicing the high voltage circuits. To discharge static high voltage, connect a 10K ohms resistor in series with a test lead between the receiver ground and CRT anode lead. DO NOT lift the CRT by the neck. Always wear shatterproof goggles when handling the CRT to protect eyes in case of implosion.

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Be aware of the instructions and procedures covering X-ray radiation. In solid-state receivers and monitors, the CRT is the only potential source of X-rays. Keep an accurate high voltage meter available at all times. Check meter calibration periodically. Whenever servicing a receiver, check the high voltage at various brightness levels to be sure it is regulating properly. Keep high voltage at rated value, NO HIGHER. Excessive high voltage may cause X-ray radiation or failure of associated components. DO NOT depend on protection circuits to keep voltage at rated value. When troubleshooting a receiver with excessive high voltage, avoid close contact with the CRT. DO NOT operate the receiver longer than necessary. To locate the cause of excessive high voltage, use a variable AC transformer to regulate voltage. In present receivers, many electrical and mechanical components have safety related characteristics which are not detectable by visual inspection. Such components are identified by a # on both the schematic and the parts list. For SAFETY, use only equivalent replacement parts when replacing these components.

GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning receiver to customer. Check repaired area for poorly soldered connections, and check entire circuit board for solder splashes. Check board wiring for pinched wires or wires contacting any high wattage resistors. Check that all control knobs, shields, covers, grounds, and mounting hardware have been replaced. Be sure to replace all insulators and restore proper lead dress.

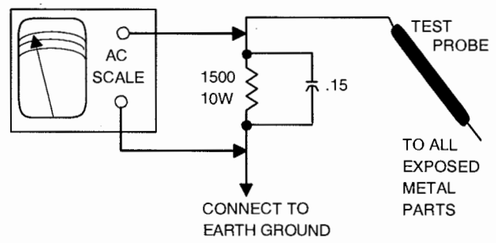
SAFETY CHECKS -- FIRE AND SHOCK HAZARD

Cold Leakage Checks for Receivers with Isolated Ground

Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch on (if applicable). Use an ohmmeter to measure the resistance between the jumped AC plug and any exposed metal cabinet parts such as antenna screw heads, control shafts, or handle brackets. Exposed metal parts with a return path should measure between 1M ohms and 5.2M ohms. Parts without a return path must measure infinity.

Hot Leakage Current Check

Plug the AC cord directly into an AC outlet. DO NOT use an isolation transformer. Use a 1500 ohms, 10W resistor in parallel with a .15µF capacitor to connect between any exposed metal parts on the receiver and a good earth ground. (See figure below.) Use an AC voltmeter with at least 5000 ohms per volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point. Voltage measurements should not exceed .75VAC, 500µA. Any value exceeding this limit constitutes a potential shock hazard and must be corrected. If the AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.



HIGH VOLTAGE SHUTDOWN TEST

Apply 120VAC, turn the receiver on, and set all customer controls for normal operation. Measure the voltage at TP7. Voltage should measure between 16.5V and 21.0V. If voltage exceeds this range the circuit must be repaired. Momentarily connect a jumper between TP7 and the cathode of D421. The receiver should lose raster and sound. If receiver does not lose raster and sound, the shutdown circuit should be repaired. To resume normal operation, remove AC power for 30 seconds and then restore AC power.

The listing of any available replacement part herein in no case constitutes a recommendation, warranty, or guarantee by Howard W. Sams & Company as to the quality and suitability of such replacement part. The numbers of the listed parts have been compiled from information furnished to Howard W. Sams & Company by the manufacturers of the specific type of replacement part listed.

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PHOTOFACT® Technical Service Data

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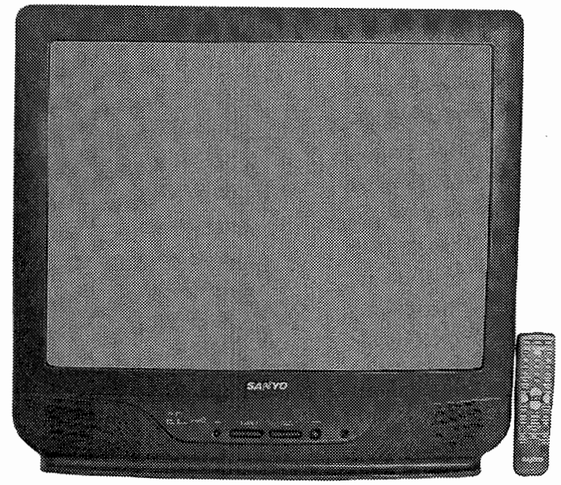
See PHOTOFACT Annual Index

SANYO

Model DS27890 (Chassis 27890-00/01)



Essential coverage for servicing a television receiver...

- **Schematics**
- **Component locations**
- **Parts list**

SAMS™ Technical Publishing

JULY 2000 SET 4312

4312

POWER SUPPLY SCHEMATIC

SANYO MODEL DS27890 (CHASSIS 27890-00/01)

W601 120VAC 990mA POLARIZED
F601 4A
LF601
C601 .22 275VAC (250VAC)
RL601 DEGAUSS
PS601 COLD PTC
L901 DEGAUSS
R601 1 7W
C631 .001 125VAC (250VAC)
R602 3.3M
D601 D602 D603 D604
C632 .0022 125VAC (250VAC)
144V△
12.5V△ 5ms
△ TAKEN FROM COMMON TIE POINT
R603 100K
C609 470µF 200V
T601
340V 10µs
L625
C625 .0027 1KV
D625
1 130V SOURCE
C628 470µF 160V
R630 22K 2W
C630 1µF
9 31.7V SOURCE
43V 10µs
L621
D621
C622 1000µF
R621 4700
C015 100µF
2 19.6V SOURCE
32.7V 10µs
D624
L623
C626 2200µF
R691 10K
D629 16.0V
R629 1000
Q627 2SA1707 REG 15.1V 11.0V
R627 10K
R628 1500
C629 220µF
8 11.5V SOURCE
D683
270
RL601 DEGAUSS
R310 47
R311 47
C331 .01
C332 47µF
D311 4.7V
15 4.7V SOURCE
R623 5600
D612 TLP621-1-BL PHOTO COUPLER
4.6V△
Q605 2SA1015 ERROR AMP 5.1V△
4.6V
-.55V△
C620 .012
D610
R615 15K
R614 68
C612 .18 63V
D609
R622 2000 2%
-.55V△
R613 27 2W
R618 27 2W
L602
-.5V △
Q604 2SC3807 OSC
Q601 2SC4423 SWITCHING 143V△
-.6V
L601
R606 10 2W
R604 12 2W
C608 .0047 1KV
385V△ 10µs
9 31.7V
R619 22K
D611 5.6V
D614
R616 1500 2%
R617 1500 2%
C613 .012
SEE IC801 PIN 27 PAGE 2E
R683 4700
C683 220µF
.68V
.06V
2SC1740 Q681 15V SWITCH DRIVE
D680 DS442X
10 NC
17
18 NC
16.5V△ 10µs
R695 22K
R694 10K
Q693 2SC1740 5V STANDBY
Q695 2SA1015 5V STANDBY
33.4V
30.0V
.55V
.24V
D693 6.2V
R693 560K
C693 .1µF
R692 68K
2 30.7V
IC601 SE130NH POWER REG
1 130V
3
Q635 2SC1740 OVERLOAD PROTECT
30.7V
7.1V
7.2V
R634 47K
C634 47µF
D627
D694
2 19.6V
R631 6800
9 31.7V
R632 1000
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2F
A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®
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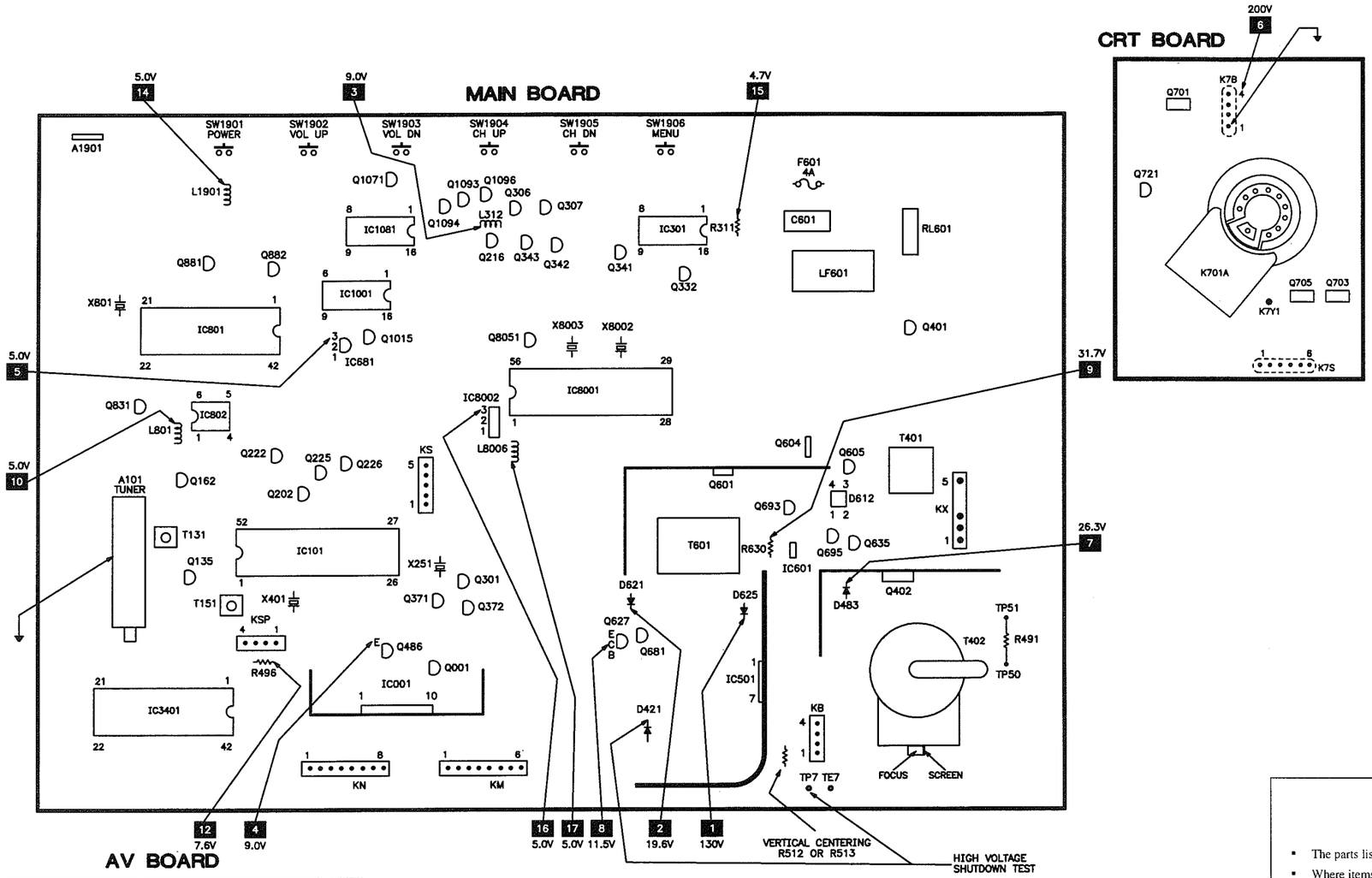
SEE T402 PAGE 2B
260V 10µs
R481 33
D481
KB
K7B
6 200V SOURCE
C482 22µF 100V
1 130V
T402
R483 1
100V 10µs
NC
D483
C486 470pF 500V
C487 1000µF
D503 36.0V
7 26.3V SOURCE
R8032 56
R8031 56
IC8002 BA178M05T 5V REG 8.2V
C8002 47µF
C8014 .1
C8053 .1
C8055 .1
16 5.0V SOURCE
L8006
C8007 .1
C8024 .1
C8065 47µF
17 5.0V SOURCE
L312
C303 .1
C304 47µF
3 9.0V SOURCE
R489 27 1W
R486 5.6 2W
Q486 2SD400 REG 10.5V 9.9V
R498 8.2
C1071 .01
C221 10µF
C1080 .01
C1081 10µF
C3400 .01
C3401 470µF
4 9.0V SOURCE
C256 470µF
C147 47µF
C258 10µF
C497 100µF
C300 .01
12 7.6V SOURCE
R487 180
D486 10.0V
D493 7.5V
IC681 TA78L05S 5V REG 15.1V
L1901
C1902 10µF
D1901 7.5V
14 5.0V SOURCE
C806 470µF
5 5.0V SOURCE
L801
C801 .01
10 5.0V SOURCE

29 30 31 32 33 34 35 36

PLACEMENT CHART



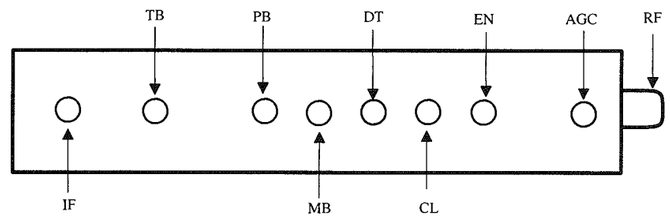
TUNER INFORMATION

TUNER VOLTAGE CHART

Pin	VHF Low Band	VHF High Band	UHF Band
AGC	2.5V	2.3V	2.2V
EN	0V	0V	0V
CL	4.2V	4.2V	4.2V
DT	4.1V	4.1V	4.1V
MB	5.1V	5.1V	5.1V
PB	5.1V	5.1V	5.1V
TB	33.6V	33.6V	33.6V
IF	0V	0V	0V

NOTE: VHF Low Band voltages taken on channel 2.
VHF High Band voltages taken on channel 7.
UHF Band voltages taken on channel 14.

TUNER TERMINAL GUIDE



TEST EQUIPMENT

Test equipment listed by participating manufacturer illustrates typical or equivalent equipment used by Sams engineers to obtain measurements. This equipment is compatible with most types used by field service technicians.

Equipment	Sencore No.	Equipment	Sencore No.
Oscilloscope	SC3100	Isolation Transformer	PR570
Generators		Capacitance Analyzer	LC102
RGB	CM2125	CRT Analyzer	CR7000
Multiburst Signal	VG91	AC Leakage Tester	PR570
Color Bar	VG91	Inductance Analyzer	LC102
TV Stereo	VG91	Flyback Yoke Tester	TVA92
Digital VOM	SC3100	Field Strength Meter	SL753
Frequency Meter	SC3100	Transistor Tester	TF46
Hi-Voltage Probe	HP200	Horizontal Analyzer	HA-2500
Accessory Probes	TP212	Video Analyzer	VG91, TVA92

Important Parts Information

- The parts listed here are those not usually available from a well-stocked supply cabinet or bin.
- Where items may be replaced with equivalent parts, several alternates are shown from participating vendors.
- On the parts lists, safety items are marked with a # to remind you that only exact replacements are recommended for these items.
- When ordering parts, state the model number, part number, and description.

Obtaining Parts

Many of these parts are available from your local Sams authorized distributor or the manufacturer of the equipment. Call Sams for the name of your nearest distributor:

800-428-7267

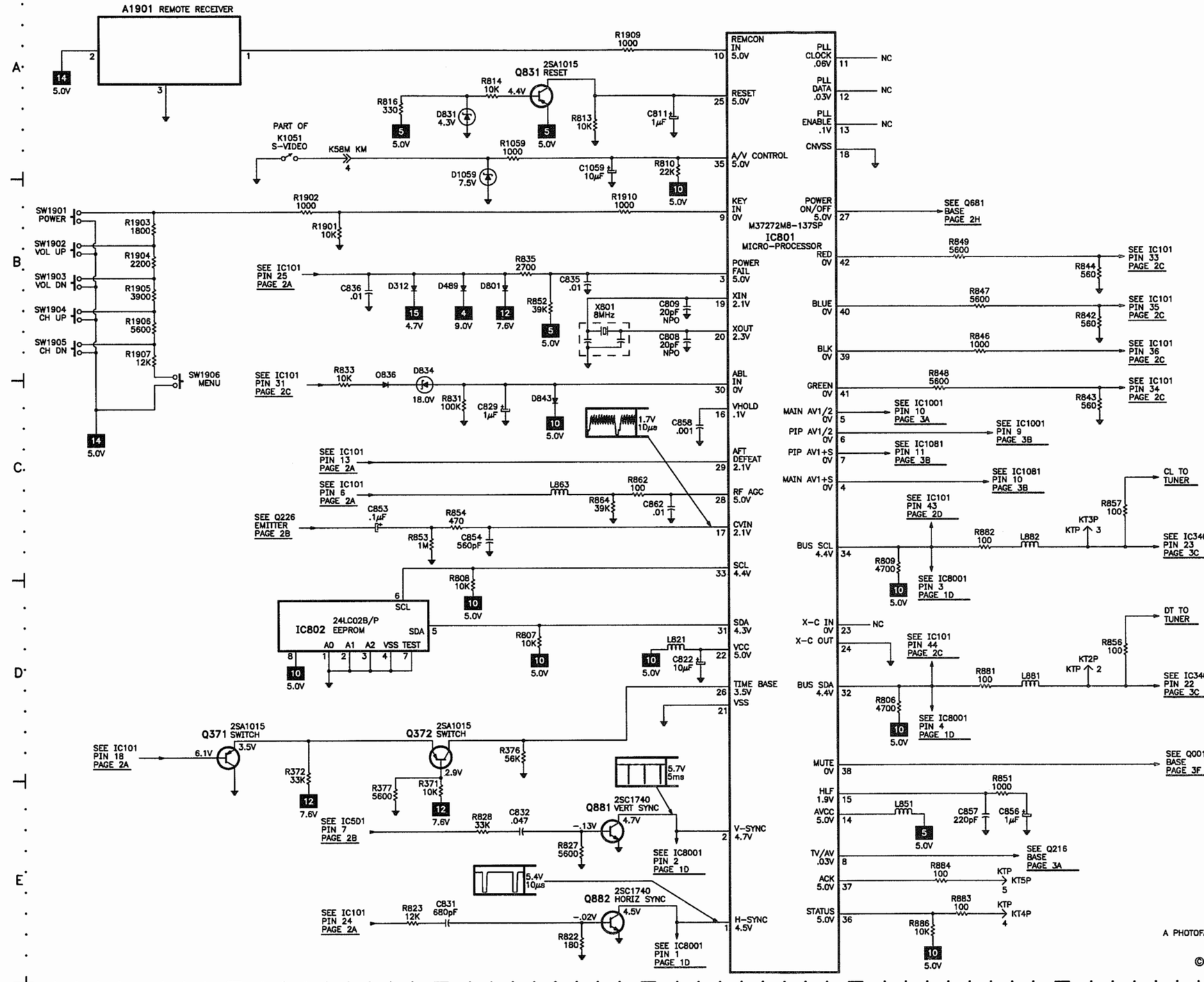
Or consult the Sams *Annual Index* for the address of the original equipment manufacturer.

Participating Vendors

Information on test equipment and replacement parts is listed in these pages for the following participating vendors. Consult the Sams *Annual Index* for their current address.

- Philips ECG Company (ECG)
- Sencore, Inc
- Terrell & Nobis (TNI Electronics)

SYSTEM CONTROL SCHEMATIC



SCHEMATIC NOTES

For SAFETY use only equivalent replacement part, see parts list.

—x— Circuitry not used in some versions.

---- Circuitry used in some versions.

Ground

Chassis ground

Common tie point

Taken from common tie point

3 Schematic CIRCUITRACE® Voltage source tie point.

A— Cabling: Heavy lines reduce use of multiple lines.

Waveforms and voltages are taken from ground, unless otherwise noted.
Waveforms taken with triggered scope and calorbar signal. Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions.
Supply voltages maintained as seen at input.
Voltages measured with digital meter and a 1000μV RF signal, with colorbar pattern applied to antenna terminal.
Controls adjusted for normal operation.
Capacitors are 50 volts or less, 5% or greater unless noted.
Electrolytic capacitors are 50 volts or less, 20% or greater unless noted.
Resistors are 1/2W or less, 5% or greater unless noted.
Value in ( ) used in some versions.
Measurements with switching as shown unless noted.
Rated voltage shown on zener diodes.

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®

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SCHEMATIC COMPONENT LOCATION GUIDE

A1901	A-21	C509	D-5	C3440	D-47	D836	C-22	Q341	C-39	R307	B-11	R691	B-34	R1901	B-22
C001	A-48	C511	D-10	C3442	B-46	D843	C-23	Q342	C-40	R308	B-12	R692	C-32	R1902	B-22
C002	B-48	C516	D-8	C3444	B-46	D1001	D-40	Q343	C-39	R309	B-12	R693	D-32	R1903	B-21
C003	A-48	C601	A-29	C3446	C-45	D1004	E-40	Q371	D-21	R310	B-35	R694	C-31	R1904	B-21
C004	B-48	C608	B-33	C3448	B-45	D1008	C-43	Q372	D-22	R311	C-35	R695	C-31	R1905	B-21
C005	B-50	C609	A-32	C8002	D-35	D1009	D-43	Q401	E-7	R312	C-38	R701	B-18	R1906	B-21
C007	B-50	C612	C-31	C8007	D-36	D1051	B-42	Q402	E-9	R332	A-38	R702	B-18	R1907	B-21
C010	B-50	C613	C-31	C8014	D-36	D1052	C-43	Q486	D-34	R333	A-39	R703	C-19	R1909	A-23
C011	A-50	C620	B-31	C8018	B-1	D1059	B-23	Q601	C-32	R334	A-40	R704	C-18	R1910	B-23
C015	B-35	C622	B-34	C8019	B-1	D1901	E-36	Q604	C-31	R341	C-39	R705	C-18	R3401	D-47
C016	D-48	C625	A-34	C8022	D-3	F601	A-29	Q605	B-30	R342	C-39	R706	C-19	R3402	D-47
C017	D-48	C626	B-34	C8023	C-2	IC001	A-49	Q627	B-35	R343	C-40	R707	A-18	R3403	C-47
C101	B-28	C628	A-36	C8024	D-36	IC101	A-8	Q635	D-31	R347	C-40	R708	A-18	R3404	C-47
C103	B-28	C629	B-36	C8025	D-3	IC101	B-14	Q681	C-35	R348	C-40	R709	B-19	R3405	C-47
C104	B-27	C630	B-35	C8028	C-2	IC101	B-6	Q693	C-32	R349	C-40	R711	A-19	R3406	C-47
C106	C-5	C631	B-30	C8029	C-1	IC101	B-9	Q695	C-31	R351	C-5	R712	C-19	R3407	C-47
C131	B-9	C632	B-31	C8030	D-3	IC101	D-6	Q701	B-19	R352	C-5	R713	B-19	R3408	C-47
C133	B-8	C634	D-32	C8032	E-3	IC301	B-38	Q703	C-19	R353	E-5	R715	B-19	R3421	B-47
C139	B-9	C683	C-34	C8033	A-1	IC501	D-8	Q705	A-19	R371	E-22	R716	C-19	R3422	B-47
C142	C-7	C693	D-32	C8036	A-1	IC601	D-30	Q721	D-18	R372	E-22	R717	A-19	R3431	B-47
C143	C-6	C701	D-19	C8038	D-1	IC681	E-34	Q831	A-23	R373	D-6	R722	D-18	R3432	C-47
C147	E-35	C703	B-18	C8039	D-1	IC801	B-24	Q881	E-23	R376	D-23	R723	D-18	R3434	B-47
C151	B-7	C705	C-18	C8041	E-3	IC802	D-22	Q882	E-23	R377	E-22	R724	D-18	R3435	B-47
C161	B-6	C707	B-18	C8042	E-3	IC1001	D-40	Q900	B-20	R400	C-17	R803	A-16	R3436	C-47
C166	C-8	C708	D-20	C8043	D-2	IC1001	D-41	Q1015	D-40	R401	C-17	R804	A-17	R3437	C-47
C202	B-13	C721	D-18	C8044	D-2	IC1001	E-43	Q1071	A-12	R403	B-17	R806	D-25	R3440	D-47
C208	B-16	C801	E-35	C8045	E-2	IC1081	A-42	Q1093	E-42	R404	E-7	R807	D-23	R3441	B-45
C211	A-14	C806	E-36	C8046	D-2	IC1081	B-43	Q1094	E-41	R406	E-7	R808	D-23	R3442	B-45
C212	B-16	C808	B-24	C8048	E-2	IC1081	D-43	Q1096	E-42	R407	E-7	R809	C-25	R3443	B-45
C221	D-35	C809	B-24	C8049	E-2	IC3401	A-46	Q8051	A-3	R411	E-9	R810	B-24	R3444	B-45
C252	C-16	C811	A-24	C8050	E-3	IC8001	A-2	R001	A-47	R418	D-10	R813	A-23	R3445	C-45
C253	C-16	C822	D-24	C8051	E-3	IC8002	D-35	R002	B-47	R421	E-6	R814	A-23	R3446	C-45
C256	E-35	C829	C-23	C8052	D-1	K1001	B-45	R003	A-48	R422	E-7	R816	A-22	R3447	C-45
C258	E-36	C831	E-22	C8053	D-36	K1001	D-39	R004	B-48	R423	D-6	R822	E-23	R3448	B-45
C272	D-16	C832	E-23	C8055	D-36	K1002	B-45	R008	B-49	R426	D-7	R823	E-22	R8001	B-1
C300	E-36	C835	B-23	C8056	E-2	K1002	E-39	R011	C-49	R428	E-6	R827	E-23	R8002	B-1
C303	D-36	C836	B-22	C8057	E-2	K1011	B-48	R012	C-49	R481	E-31	R828	E-23	R8003	C-1
C304	D-36	C841	B-16	C8058	E-2	K1021	C-48	R101	B-27	R482	E-6	R831	C-23	R8004	C-1
C307	B-11	C842	B-15	C8065	D-36	K1051	B-22	R106	B-27	R483	E-30	R833	C-22	R8007	C-2
C308	B-11	C843	B-15	C8067	A-1	K1051	C-42	R133	B-8	R485	D-16	R835	B-23	R8009	C-2
C309	B-38	C853	C-22	C8068	B-1	L164	B-8	R136	A-9	R486	D-34	R842	B-26	R8013	C-1
C310	B-39	C854	C-23	D101	B-27	L166	C-8	R137	A-10	R487	E-34	R843	C-26	R8016	A-1
C312	B-12	C856	E-25	D103	B-28	L305	B-39	R138	B-9	R489	D-34	R844	B-26	R8017	A-1
C313	B-37	C857	E-25	D311	C-35	L306	B-11	R142	C-6	R491	D-13	R846	B-25	R8018	E-3
C314	B-37	C858	C-24	D312	B-22	L309	B-39	R143	B-5	R492	D-15	R847	B-25	R8021	E-3
C315	B-37	C862	C-24	D351	E-5	L310	D-37	R151	B-7	R493	D-13	R848	C-25	R8023	A-3
C316	B-37	C1000	B-43	D421	D-7	L312	D-35	R159	A-7	R494	D-13	R849	B-25	R8024	A-2
C317	C-37	C1001	D-39	D422	D-7	L332	A-39	R160	B-8	R497	A-20	R851	E-25	R8028	A-3
C318	C-37	C1004	E-40	D428	E-6	L341	C-39	R161	B-6	R498	D-35	R852	B-23	R8030	D-3
C322	C-37	C1051	B-42	D429	E-6	L401	E-8	R162	B-6	R503	D-7	R853	C-22	R8031	D-34
C323	C-37	C1052	C-43	D481	E-31	L402	E-9	R163	B-7	R504	D-8	R854	C-23	R8032	D-34
C331	C-36	C1059	B-23	D482	E-6	L413	D-10	R164	B-8	R505	D-8	R856	D-26	R8035	B-2
C332	C-36	C1071	D-35	D483	E-30	L601	C-32	R165	B-8	R506	D-8	R857	C-26	R8036	B-2
C336	A-39	C1080	D-35	D486	E-34	L602	C-32	R167	B-5	R507	D-8	R859	C-39	R8067	A-1
C341	C-39	C1081	D-36	D487	D-15	L621	B-34	R168	B-5	R508	D-8	R862	C-23	R8068	B-2
C342	C-39	C1902	E-36	D489	B-23	L623	B-34	R169	B-7	R509	D-8	R864	C-23	RL601	A-30
C343	C-40	C3400	D-36	D493	E-35	L625	A-33	R202	B-10	R511	D-10	R881	D-25	RL601	B-36
C344	C-40	C3401	D-36	D501	D-9	L800	C-27	R204	B-13	R512	D-11	R882	C-25	SP901	B-51
C351	C-5	C3402	C-46	D503	E-32	L801	E-35	R205	B-13	R513	D-11	R883	E-25	SP902	A-51
C352	D-5	C3403	C-46	D601	A-31	L813	B-16	R207	B-10	R517	D-9	R884	E-25	SW1901	B-21
C371	D-6	C3404	D-47	D602	A-31	L814	B-17	R212	B-16	R518	D-8	R886	E-25	SW1902	B-21
C401	B-17	C3406	E-47	D603	A-31	L821	D-24	R216	C-39	R601	A-30	R1001	D-39	SW1903	B-21
C403	C-17	C3407	A-46	D604	A-31	L851	E-25	R217	C-39	R602	B-30	R1002	D-41	SW1904	B-21
C405	B-17	C3408	C-47	D609	C-31	L863	C-23	R221	C-11	R603	A-32	R1003	D-41	SW1905	B-21
C406	E-7	C3409	D-47	D610	B-31	L881	D-25	R222	C-11	R604	B-33	R1004	E-39	SW1906	C-21
C407	E-7	C3410	D-47	D611	C-30	L882	C-25	R223	C-11	R606	B-32	R1005	E-40	T131	B-8
C408	E-7	C3411	D-46	D612	B-30	L901	B-30	R224	C-11	R613	C-32	R1006	E-40	T151	B-6
C410	E-9	C3412	E-46	D612	C-30	L902	D-10	R225	C-12	R614	C-31	R1011	D-42	T401	E-7
C412	E-10	C3413	C-47	D612	C-30	L1901	E-35	R226	C-12	R615	B-32	R1012	E-40	T402	D-11
C416	E-10	C3414	D-46	D614	C-31	L8006	D-35	R251	C-16	R616	C-30	R1015	E-41	T402	E-29
C421	D-6	C3416	C-47	D621	B-34	LF601	A-29	R252	C-16	R617	C-31	R1051	B-42	T601	A-33
C426	D-6	C3417	D-46	D624	B-33	PS601	A-30	R271	B-15	R618	C-32	R1052	C-43	W601	A-29
C473	E-9	C3418	D-46	D625	A-34	Q001	C-49	R272	D-16	R619	C-30	R1053	B-42	X141	B-5
C482	E-31	C3419	D-46	D627	D-32	Q135	A-9	R273	D-16	R621	B-34	R1054	B-43	X153	A-7
C484	E-6	C3423	E-46	D629	B-34	Q162	B-8	R276	D-16	R622	C-31	R1059	B-23	X161	B-8
C486	E-30	C3424	D-46	D680	C-35	Q202	B-10	R281	E-5	R623	B-30	R1071	A-12	X251	B-14
C487	E-32	C3426	E-46	D683	B-35	Q216	C-39	R287	A-17	R627	B-35	R1081	C-43	X401	D-6
C493	D-13	C3427	E-46	D693	D-32	Q222	C-11	R288	B-17	R628	C-35	R1082	D-43	X801	B-23
C497	E-36	C3428	C-46	D694	D-32	Q225	C-11	R289	B-18	R629	C-34	R1091	E-42	X8002	D-1
C502	D-9	C3429	E-46	D721	D-18	Q226	C-12	R301	C-14	R630	B-35	R1092	E-42	X8003	D-1
C503	D-8	C3431	E-46	D722	D-18	Q301	C-14	R302	C-14	R631	D-31	R1093	E-42		
C504	D-8	C3435	B-47	D801	B-23	Q306	B-11	R303	C-14	R632	D-31	R1094	E-42		
C505	D-5	C3437	C-47	D831	A-23	Q307	B-12	R305	B-10	R634	D-31	R1095	E-42		
C506	D-7	C3439	C-46	D834	C-22	Q332	A-39	R306	B-11	R683	C-34	R1096	E-43		

MISCELLANEOUS ADJUSTMENTS

HIGH VOLTAGE CHECK

Tune in a picture. Set customer controls to minimum. Connect a high voltage probe to CRT anode. High voltage should measure 27.5kV to 29kV.

CONVERGENCE / PURITY

The deflection yoke is bonded to the CRT. Convergence and purity adjustments are not required.

ENTERING SERVICE MODE

Disconnect the AC power cord. While pressing the menu button on the front of the set, connect the AC power cord. Use the channel up and down buttons to select the service number. Use volume up and down buttons to change the value. To exit service mode press the menu button.

HORIZONTAL POSITION

Tune in a crosshatch pattern. Enter the service mode and select service number 01. Adjust for the best horizontal centering.

RF AGC DELAY

Tune in a picture. Enter the service mode and select service number 03. Adjust where no snow (noise) appears in picture.

VERTICAL SIZE

Tune in a crosshatch pattern. Enter the service mode and select service number 07. Adjust for proper vertical size and best vertical linearity.

VERTICAL CENTERING

Tune in a crosshatch pattern. Check that the pattern is centered. If too low, install resistor R513 (470 ohms 1W). If too high, install resistor R512 (470 ohms 1W).

GRAY SCALE

Tune in an active channel. Enter the service mode. Set the value of service numbers 08, 09, and 10 to 0. Set the value of service numbers 11 and 12 to 55. Set screen control, color, brightness, and picture to minimum. Adjust screen control, if necessary, to obtain a barely visible horizontal line. Select service number 41. Adjust the bias levels for a white line. Select service number 40 and adjust the drive values for normal black and white picture at all brightness levels.

SUB BRIGHTNESS

Tune in a color bar pattern. Set picture and brightness to normal. Connect positive lead of a digital voltmeter to TP51 and the negative lead to TP50. Enter the service mode and select service number 25. Adjust for 520mV ±10mV.

SUB COLOR, SUB TINT, SUB SHARPNESS

Tune in a picture. Enter the service mode. Select service number 26. Adjust for normal color level. Select service number 27. Adjust for normal flesh tones. Select service number 28. Adjust for contrast range.

OSD HORIZONTAL POSITION

Tune in a local channel. Enter the service mode and select service number 31. Adjust for centered on screen menu.

STEREO ADJUSTMENTS

All adjustments were made using an MTS/TV-stereo generator connected to the antenna terminal. Set customer controls for normal listening levels.

Input Level

Set generator to 1kHz audio frequency and L-R modulating signal. Connect an oscilloscope to pin 7 of IC3401. Enter service mode and select service number 32. Adjust for 0.7Vp-p waveform.

Stereo VCO

Connect a jumper between the base of Q135 and ground. Connect a frequency counter to pin 40 of IC3401 and ground. Enter the service mode and select service number 33. Adjust for 15.734kHz ±100Hz.

SAP VCO

Connect a jumper between the base of Q135 and ground. Connect a 1M ohm resistor between pin 12 of IC3401 and ground. Connect a frequency counter to pin 40 of IC3401. Enter the service mode and select service number 37. Adjust for 78.67kHz ±500Hz.

Filter

Enter the service mode and select service number 34. Set the value to 32.

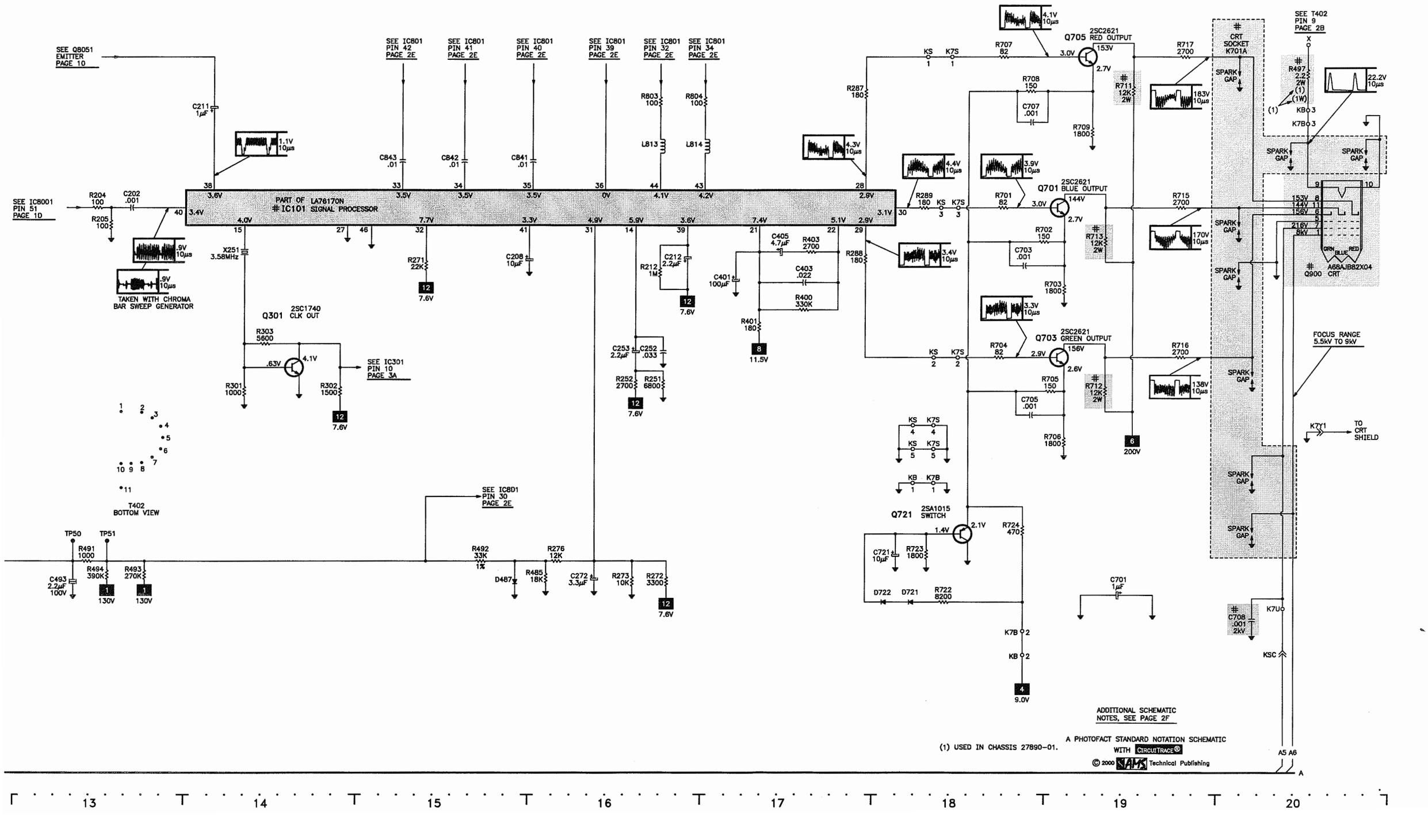
Separation

Set generator to pilot, 300Hz audio frequency, and left modulating signal. Connect an oscilloscope to pin 25 of IC3401 and ground. Enter the service mode and select service number 35. Adjust for minimum amplitude of the waveform. Set generator to 8kHz audio frequency. Select service number 36 and adjust for minimum amplitude of the waveform.

IC802 REPLACEMENT

Perform the following adjustments after replacing IC802. Enter the service mode, select service number 01, and set value to 19. Select service number 11, and set value to 60. Select service number 12 and set value to 60. Select service number 13 and set value to 0. Select service number 14 and set value to 1. Select service number 21 and set value to 7. Select service number 26 and set value to 8. Select service number 27 and set value to 19. Select service number 29 and set value to 116. Select service number 30 and set value to 54. Select service number 31 and set value to 47. Exit service mode.

TELEVISION SCHEMATIC continued


C
D
SEE Q8051 EMITTER PAGE 10
SEE IC801 PIN 42 PAGE 2E
SEE IC801 PIN 41 PAGE 2E
SEE IC801 PIN 40 PAGE 2E
SEE IC801 PIN 39 PAGE 2E
SEE IC801 PIN 32 PAGE 2E
SEE IC801 PIN 34 PAGE 2E
SEE IC8001 PIN 51 PAGE 1D
PART OF LA76170N #IC101 SIGNAL PROCESSOR
TAKEN WITH CHROMA BAR SWEEP GENERATOR
Q301 2SC1740 CLK OUT
SEE IC301 PIN 10 PAGE 3A
T402 BOTTOM VIEW
SEE IC8D1 PIN 30 PAGE 2E
Q705 2SC2621 RED OUTPUT
Q701 2SC2621 BLUE OUTPUT
Q703 2SC2621 GREEN OUTPUT
Q721 2SA1015 SWITCH
SEE T402 PIN 9 PAGE 2B
CRT SOCKET K701A
SPARK GAP
Q900 A68AJB82X04 CRT
FOCUS RANGE 5.5kV TO 9kV
TO CRT SHIELD
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2F
(1) USED IN CHASSIS 27890-01.
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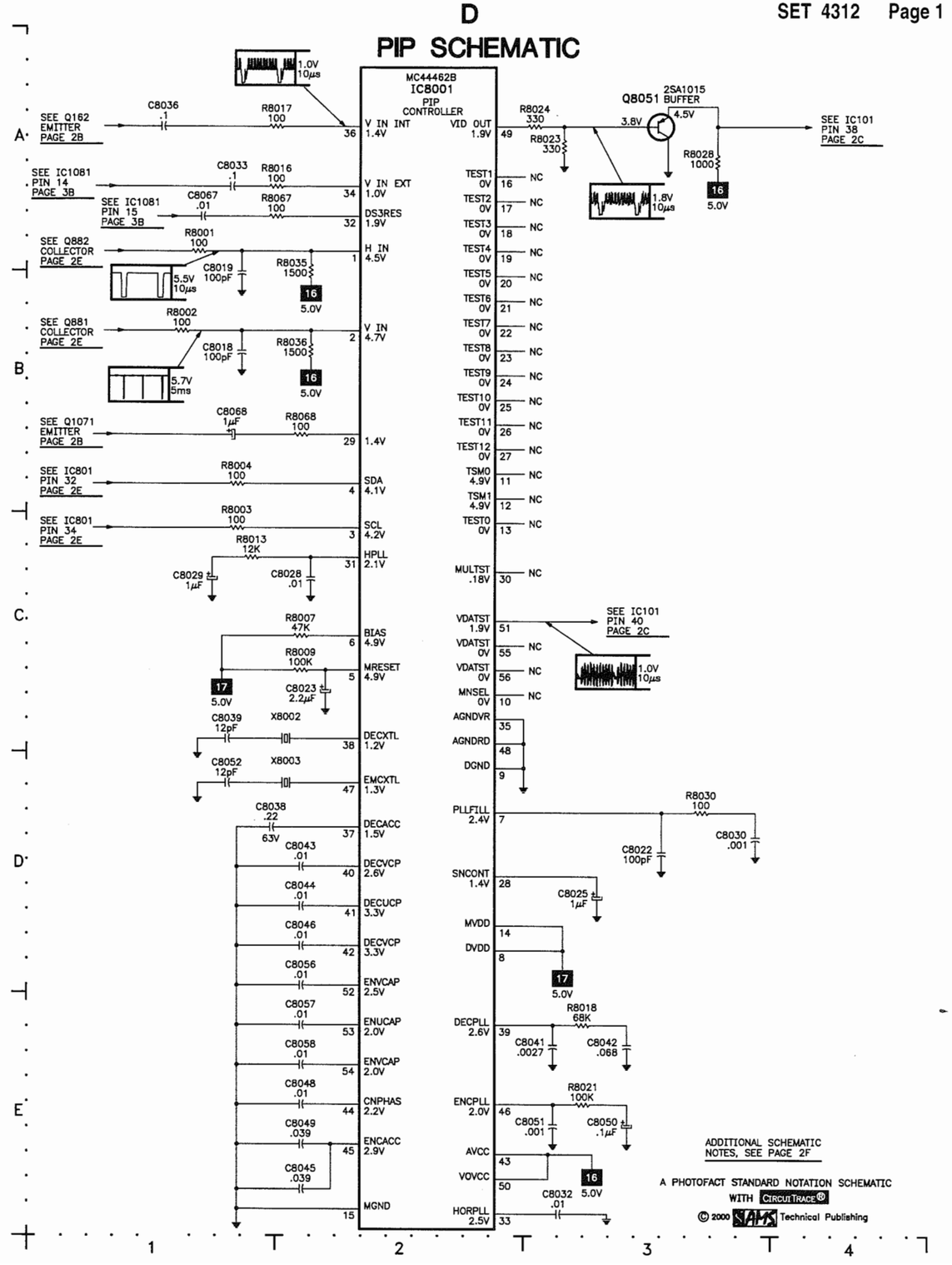
MISCELLANEOUS ADJUSTMENTS continued

SERVICE MODE ADJUSTMENT CHART

Service No.	Adjustment	Value Range	Initial Value	On-Set Value	Notes
01	HP	0 - 31	19	19	H-Position (H-Centering)
02	IAS	0, 1	0	0	IF AGC Switch, 0 = TV (Normal), 1 = AV (IF Gain Minimum)
03	RAD	0 - 63	25	38	RF AGC Delay
04	PT	0 - 127	64	62	PLL Tuning
05	ADA	0 - 63	31	30	APC Detect
06	CD	0, 1	0	0	C-Diff
07	VS	0 - 63	32	27	Vertical Size
08	RB	0 - 127	0	40	Red Bias
09	GB	0 - 127	0	28	Green Bias
10	BB	0 - 127	0	0	Blue Bias
11	RD	0 - 127	60	71	Red Drive
12	BD	0 - 127	60	58	Blue Drive
13	TDS	0, 1	0	0	Trap & D (B.P.F.) Switch, 0 = Off, 1 = On
14	AF	0, 1	1	1	Auto Flesh, 0 = Off, 1 = On
15	BS	0, 1	0	0	Black Stretch, 0 = On, 1 = Off
16	VL	0 - 7	4	4	Video Level
17	FL	0 - 31	15	15	FM Level
18	NIS	0, 1	1	1	Black Noise Inverter, 0 = On, 1 = Off
19	ABL	0, 1	1	1	ABL Defeat, 0 = On, 1 = Off
20	WP	0, 1	1	1	White Peak, 0 = On, 1 = Off
21	GD	0 - 15	7	7	Green Drive Reduction
22	VC	0 - 7	0	0	Vert. Comp
23	VD	0 - 63	32	32	Vert. DC
24	AG	0 - 3	0	0	AFC Gain 00 = Auto, 01 = High gain, 10 = Low gain, 11 = None-Gate.
25	SB	0 - 63	32	27	Sub Brightness
26	SCO	0 - 31	8	9	Sub Color
27	STI	0 - 31	19	19	Sub Tint
28	SSH	0 - 15	8	8	Sub Sharpness
29	OPT	0 - 255	116	116	Option, data 1 should be to "116", in binary 8 bit 01110100
30	OP2	0 - 255	54	54	Option, data 2 should be to "54", in binary 8 bit 00110110
31	HR	0 - 63	47	47	OSD H-Position
32	INP	0 - 63	32	19	Input Level
33	STE	0 - 63	32	24	Stereo VCO
34	FIL	0 - 63	63	27	Filter
35	LSP	0 - 63	32	11	Low Separation
36	HSP	0 - 63	32	19	High Separation
37	SPV	0 - 63	32	28	SAP VCO
38	PCO	0 - 63	32	32	PIP Color
39	PTI	0 - 63	32	32	PIP Tint
40	DRV	0 - 127	60	71	Red Drive, press 1 to decrease value and 3 to increase value
	DRV	0 - 127	60	58	Blue Drive, press 7 to decrease value and 9 to increase value
41	-	0 - 127	0	-	Red Bias, press 1 to decrease value and 3 to increase value
	-	0 - 127	0	-	Green Bias, press 4 to decrease value and 6 to increase value
	-	0 - 127	0	-	Blue Bias, press 7 to decrease value and 9 to increase value

D PIP SCHEMATIC



TELEVISION SCHEMATIC

(1) USED IN CHASSIS 27890-01.

ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2F

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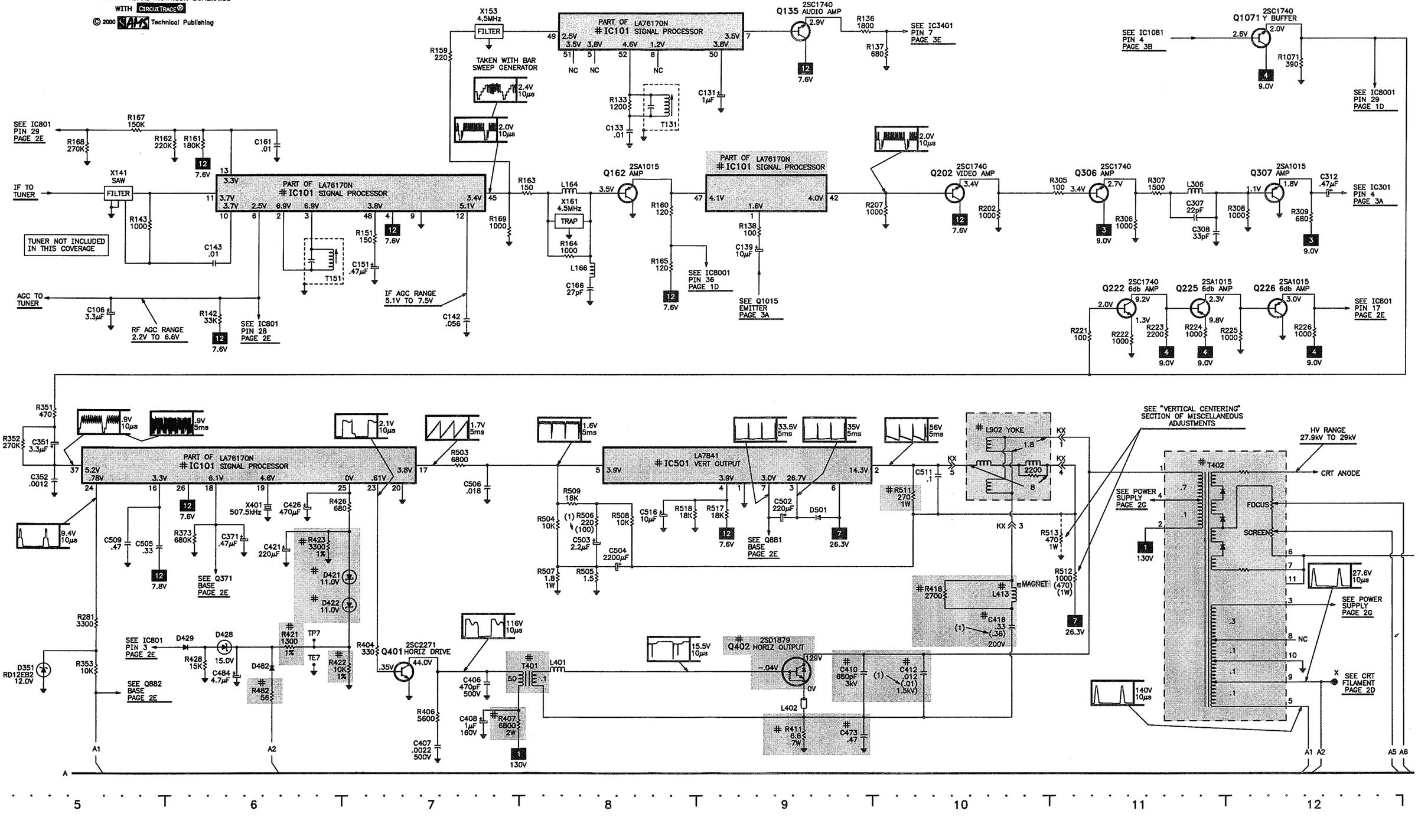
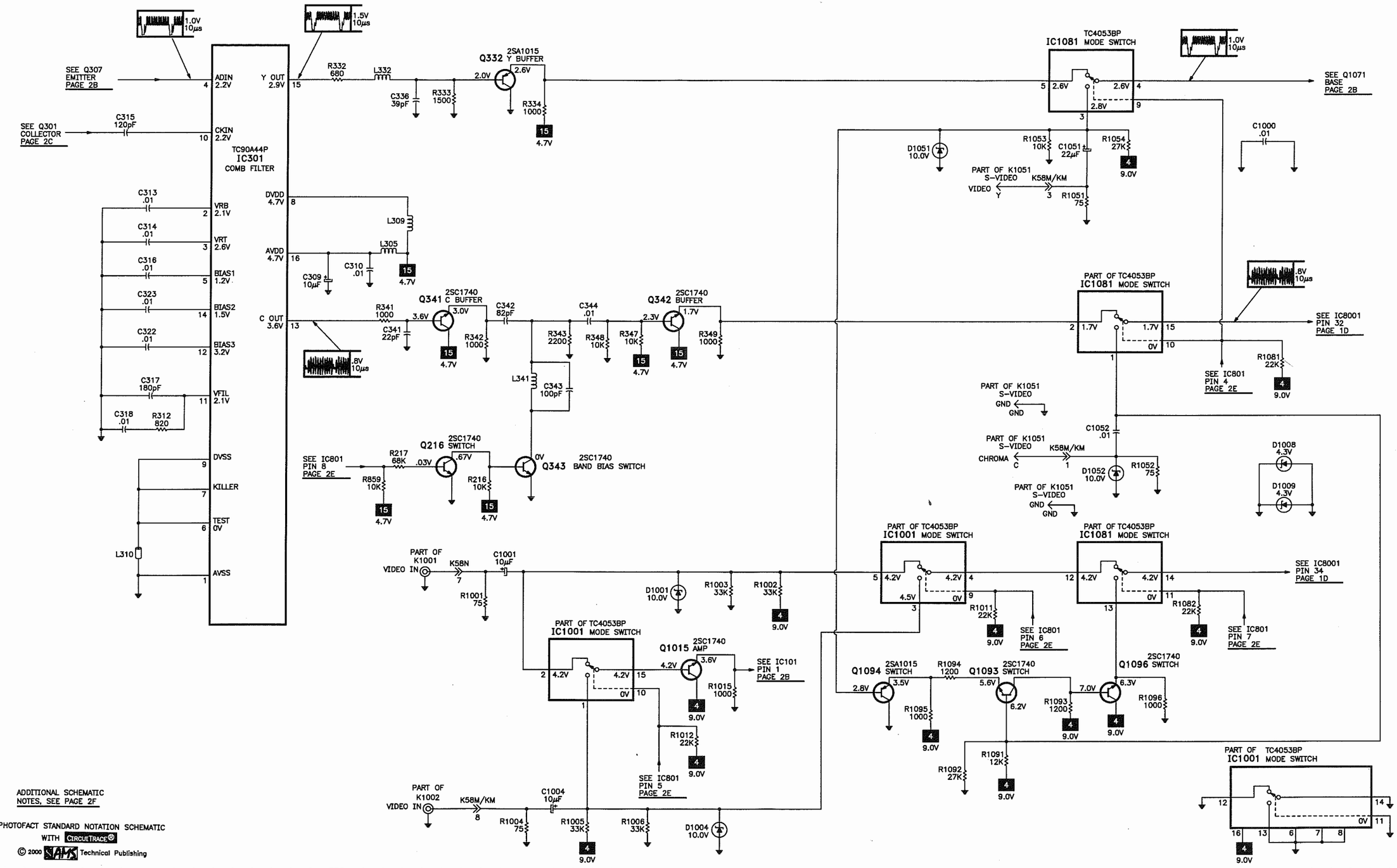


COMB FILTER, VIDEO SWITCHING SCHEMATIC



PARTS LIST

SEMICONDUCTORS

(Select the replacement that gives the best results.)

	Item No.	Type No.	Mfr. Part No.	ECG Part No.
	D101	RD36EB1	407 056 2307	ECG5037A
		MTZJ36A	407 100 0204	-
	D103	RD5.1FB2	407 056 8903	ECG135A
		RD5.1FB3	407 056 9009	-
	D311	MTZJ4.7A	407 099 5006	-
		RD5.1EB1	407 056 7906	ECG5010A
	D312	DS442X	407 005 4505	ECG519
		1N4148	408 008 2406	ECG519
		1SS133	407 012 4406	ECG519
		1S2076	407 013 4207	ECG177
		1S2473	407 013 7109	ECG177
	D351	MTZJ12B	407 099 6607	ECG5021T1
		MTZJ12C	407 063 8408	ECG5021T1
		RD12EB2	407 054 3207	ECG5021T1
		RD12EB3	407 054 3306	ECG5021A
#	**D421, 22**	HZ11B2L	407 158 1307	ECG5020A
	D428	MTZJ15A	407 099 6904	-
		RD15EB1	407 054 5706	ECG5023A
	D429	DS442X	407 005 4505	ECG519
		1N4148	408 008 2406	ECG519
		1SS133	407 012 4406	ECG519
		1S2076	407 013 4207	ECG177
		1S2473	407 013 7109	ECG177
	D481	ERA18-04	407 124 6404	ECG552
		ES1	407 007 6606	ECG552
		RMPG06G	407 124 5506	ECG552
	D482	TVR1G	407 011 4407	ECG552
	D483	ERA18-04	407 124 6404	ECG552
		ES1	407 007 6606	ECG552
		RMPG06G	407 124 5506	ECG552
	D486	MTZJ10B	407 099 6102	-
		RD10EB2	407 054 0008	ECG5019A
	D487	ERA15-02	407 005 8602	ECG552
		MPG06D	407 088 6502	ECG552
		S5277B	407 011 3004	ECG552
		1N4002ID	408 009 9404	ECG116
	D489	DS442X	407 005 4505	ECG519
		1N4148	408 008 2406	ECG519
		1SS133	407 012 4406	ECG519
		1S2076	407 013 4207	ECG177
		1S2473	407 013 7109	ECG177
	D493	RD7.5EB3	407 057 6502	ECG5015A
		MTZJ7.5C	407 063 9306	-
	D501	ERA15-02	407 005 8602	ECG552
		MPG06D	407 088 6502	ECG552
		S5277B	407 011 3004	ECG552
		1N4002ID	408 009 9404	ECG116
	D503	RD36EB1	407 056 2307	ECG5037A
		MTZJ36A	407 100 0204	-
#	**D601** Thru			
#	**D604**	1S1887A	407 013 3200	ECG552
		EM2B	407 005 7605	ECG125
		GP15G	408 008 8606	ECG125
	D609	ERA18-02	407 124 6503	ECG552
		ES1Z	407 007 6903	ECG552
		RMPG06D	407 124 5605	ECG587
		BYD33D	408 009 9008	ECG569
	D610	1N4148	408 008 2406	ECG519
		1S2076A	407 013 4306	ECG519
		1S2471	407 013 6508	ECG519
	D611	MTZJ5.6C	407 063 8903	-
		RD5.6EB3	407 057 0104	ECG5011A
#	**D612**	TLP621-1-BL	407 175 9904	ECG3098
		0N3131S	407 147 5705	-
		PC817C	407 104 2402	ECG3098
		PC817D	407 106 6101	ECG3098
	D614	1N4148	408 008 2406	ECG519
		1S2076A	407 013 4306	ECG519
		1S2471	407 013 6508	ECG519
#	**D621**	RU3YX	407 106 2806	ECG588
#	**D624**	RU4YXLF-L1	407 129 6706	ECG580
#	**D625**	RU4AMLF-L1	407 129 7000	ECG580
	D627	1N4148	408 008 2406	ECG519
		1SS133	407 012 4406	ECG519
		1S2076	407 013 4207	ECG177
		1S2473	407 013 7109	ECG177
		DS442X	407 005 4505	ECG519
	D629	MTZJ16A	407 099 7208	-
		RD16EB1	407 054 7007	ECG5025A

 # For SAFETY use only equivalent replacement part.

SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.
D680, 83	DS442X	407 005 4505	ECG519
	1N4148	408 008 2406	ECG519
	1SS133	407 012 4406	ECG519
	1S2076	407 013 4207	ECG177
	1S2473	407 013 7109	ECG177
D693	MTZJ6.2B	407 099 5402	ECG5013T1
	RD6.2EB2	407 057 2702	ECG5013A
D694	1N4148	408 008 2406	ECG519
	DS442X	407 005 4505	ECG519
	1SS133	407 012 4406	ECG519
	1S2076	407 013 4207	ECG177
	1S2473	407 013 7109	ECG177
D721, 22	DS442X	407 005 4505	ECG519
	1N4148	407 008 2406	ECG519
	1SS133	407 012 4406	ECG519
	1S2076	407 013 4207	ECG177
	1S2473	407 013 7109	ECG177
D801	DS442X	407 005 4505	ECG519
	1N4148	408 008 2406	ECG519
	1SS133	407 012 4406	ECG519
	1S2076	407 013 4207	ECG177
	1S2473	407 013 7109	ECG177
D831	MTZJ3.6B	407 065 1308	-
	RD4.3EB2	407 056 4707	ECG5008A
D834	RD18EB3	407 054 8509	ECG5027A
	MTJ18C	407 099 7703	-
D836, 43	DS442X	407 005 4505	ECG519
	1N4148	408 008 2406	ECG519
	1SS133	407 012 4406	ECG519
	1S2076	407 013 4207	ECG177
	1S2473	407 013 7109	ECG177
D1001, 04	MTZJ10B	407 099 6102	-
	RD10EB2	407 054 0008	ECG5019A
D1008, 09	MTZJ3.6B	407 065 1308	-
	RD4.3EB2	407 056 4707	ECG5008A
D1051, 52	MTZJ10B	407 099 6102	-
	RD10EB2	407 054 0008	ECG5019A
D1059, 1901	MTZJ7.5C	407 063 9306	-
	RD7.5EB3	407 057 6502	ECG5015A
IC001	LA4600	409 389 4607	-
# **IC101**	LA76170N	409 431 2100	-
IC301	TC90A44P	409 406 1107	-
# **IC501**	LA7841	409 340 1904	-
# **IC601**	SE130NH	409 172 8102	-
IC681	TA78L05S	409 241 8309	ECG977
	MC78M05CT	409 172 1509	ECG960
	UPC78L05J	409 066 7303	ECG977
	UPC78M05AHF	409 320 5700	ECG960
IC801	M37272M8-137SP	410 342 5306	-
IC802	24LC02B/P	409 333 3700	-
	ST24C02B6	409 376 1503	-
IC1001	TC4053BP	409 051 3006	ECG4053B
IC1081	TC4053BP	409 051 3006	ECG4053B
IC3401	UPC1851BCU	409 432 7807	-
IC8001	MC44462B	409 418 8418	-
IC8002	BA178M05T	409 241 5407	ECG1960
Q001, 135	2SC1740S-Q	405 011 8401	ECG85
	2SC1740S-R	405 011 8500	ECG85
	2SC1740S-S	405 011 8609	ECG85
	2SC1815-GR	405 012 2002	ECG85
	2SC1815-O	405 012 2101	ECG85
	2SC1815-Y	405 012 2309	ECG85
	2SC945A-PA	405 020 7501	ECG85
	2SC945A-QA	405 020 7709	ECG85
	2SC945A-RA	405 020 7907	ECG85
Q162	2SA1015-GR(SAN)	406 000 6804	ECG290A
	2SA1015-O(SAN)	405 001 7407	ECG290A
	2SA1015-Y(SAN)	405 001 7605	ECG290A
	2SA564A-Q(CU)	405 004 3109	ECG290A
	2SA564A-R(CU)	405 004 3208	ECG290A
	2SA933S-Q	405 006 1707	ECG290A
	2SA933S-R	405 006 1806	ECG290A

 # For SAFETY use only equivalent replacement part.

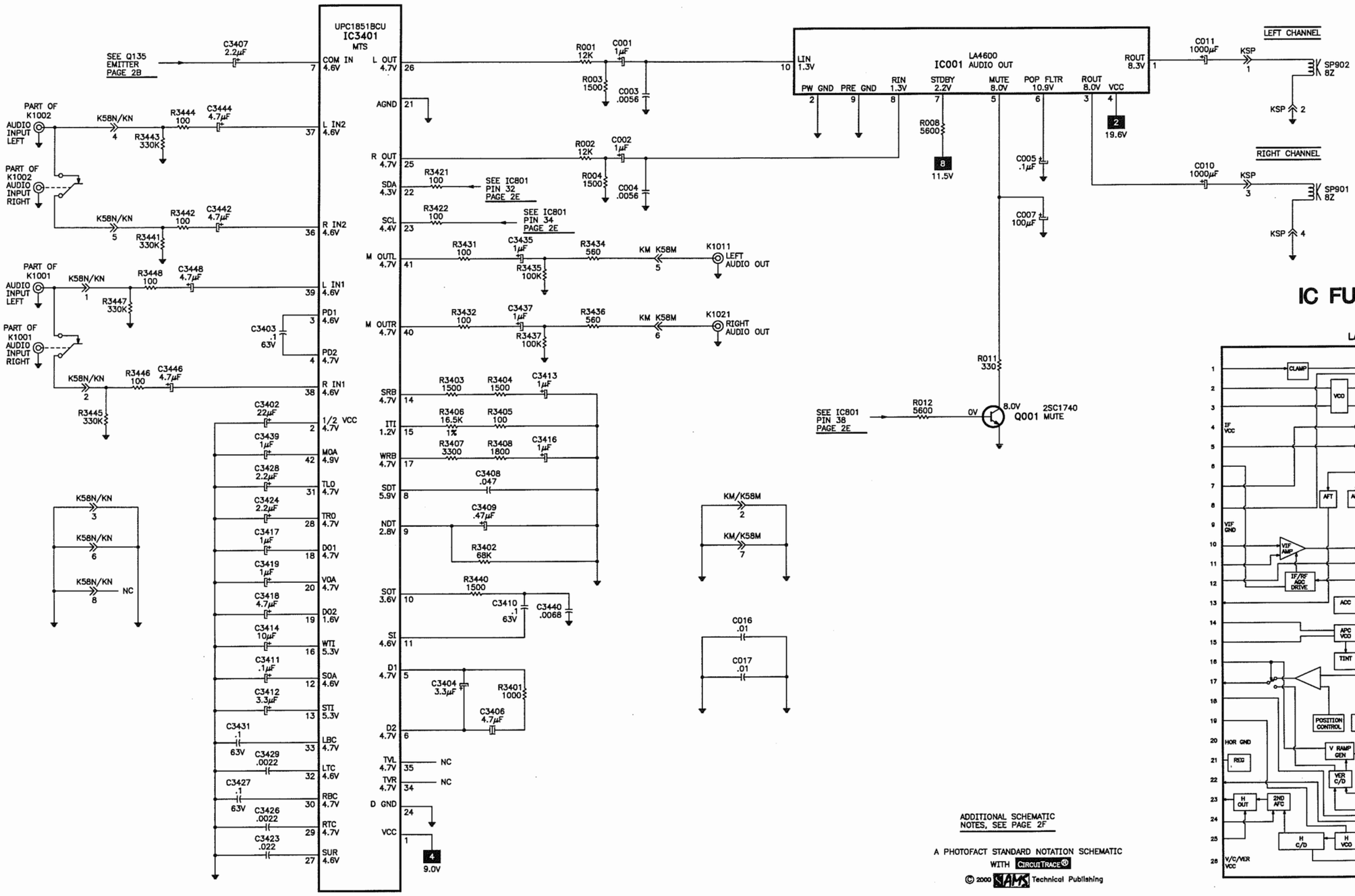
SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.
Q202, 16, 22	2SC1740S-Q	405 011 8401	ECG85
	2SC1740S-R	405 011 8500	ECG85
	2SC1740S-S	405 011 8609	ECG85
	2SC1815-GR	405 012 2002	ECG85
	2SC1815-O	405 012 2101	ECG85
	2SC1815-Y	405 012 2309	ECG85
	2SC945A-PA	405 020 7501	ECG85
	2SC945A-QA	405 020 7709	ECG85
	2SC945A-RA	405 020 7907	ECG85
Q225, 26	2SA1015-GR(SAN)	406 000 6804	ECG290A
	2SA1015-O(SAN)	405 001 7407	ECG290A
	2SA1015-Y(SAN)	405 001 7605	ECG290A
	2SA564A-Q(CU)	405 004 3109	ECG290A
	2SA564A-R(CU)	405 004 3208	ECG290A
	2SA933S-Q	405 006 1707	ECG290A
	2SA933S-R	405 006 1806	ECG290A
Q301, 06	2SC1740S-Q	405 011 8401	ECG85
	2SC1740S-R	405 011 8500	ECG85
	2SC1740S-S	405 011 8609	ECG85
	2SC1815-GR	405 012 2002	ECG85
	2SC1815-O	405 012 2101	ECG85
	2SC1815-Y	405 012 2309	ECG85
	2SC945A-PA	405 020 7501	ECG85
	2SC945A-QA	405 020 7709	ECG85
	2SC945A-RA	405 020 7907	ECG85
Q307, 32	2SA1015-GR(SAN)	406 000 6804	ECG290A
	2SA1015-O(SAN)	405 001 7407	ECG290A
	2SA1015-Y(SAN)	405 001 7605	ECG290A
	2SA564A-Q(CU)	405 004 3109	ECG290A
	2SA564A-R(CU)	405 004 3208	ECG290A
	2SA933S-Q	405 006 1707	ECG290A
	2SA933S-R	405 006 1806	ECG290A
Q341, 42, 43	2SC1740S-Q	405 011 8401	ECG85
	2SC1740S-R	405 011 8500	ECG85
	2SC1740S-S	405 011 8609	ECG85
	2SC1815-GR	405 012 2002	ECG85
	2SC1815-O	405 012 2101	ECG85
	2SC1815-Y	405 012 2309	ECG85
	2SC945A-PA	405 020 7501	ECG85
	2SC945A-QA	405 020 7709	ECG85
	2SC945A-RA	405 020 7907	ECG85
Q371, 72	2SA1015-GR(SAN)	406 000 6804	ECG290A
	2SA1015-O(SAN)	405 001 7407	ECG290A
	2SA1015-Y(SAN)	405 001 7605	ECG290A
	2SA564A-Q(CU)	405 004 3109	ECG290A
	2SA564A-R(CU)	405 004 3208	ECG290A
	2SA933S-Q	405 006 1707	ECG290A
	2SA933S-R	405 006 1806	ECG290A
Q401	2SC2271-D-CTV	405 013 6207	ECG399
	2SC2271-E-CTV	405 013 6306	ECG399
# **Q402**	2SD1879-OTB-YB	405 082 2407	ECG2331
Q486	2SD400-E-MP	405 023 5009	ECG382
	2SD400-F-MP	405 023 5306	ECG382
# **Q601**	2SC4423-CTV	405 095 9004	ECG2308
Q604	2SC3807-R-CTV-YA	405 058 0208	ECG2504
Q605	2SA1015-GR(SAN)	406 000 6804	ECG290A
	2SA1015-O(SAN)	405 001 7407	ECG290A
	2SA1015-Y(SAN)	405 001 7605	ECG290A
	2SA564A-Q(CU)	405 004 3109	ECG290A
	2SA564A-R(CU)	405 004 3208	ECG290A
	2SA933S-Q	405 006 1707	ECG290A
	2SA933S-R	405 006 1806	ECG290A
Q627	2SA1707-S	405 089 0000	-
	2SA1707-T	405 089 0109	-
	2SB985-S	405 009 6907	-
	2SB985-T	405 009 7003	-
Q635, 81, 93	2SC1740S-Q	405 011 8401	ECG85
	2SC1740S-R	405 011 8500	ECG85
	2SC1740S-S	405 011 8609	ECG85
	2SC1815-GR	405 012 2002	ECG85
	2SC1815-O	405 012 2101	ECG85
	2SC1815-Y	405 012 2309	ECG85
	2SC945A-PA	405 020 7501	ECG85
	2SC945A-QA	405 020 7709	ECG85
	2SC945A-RA	405 020 7907	ECG85
Q695	2SA1015-Y(SAN)	405 001 7605	ECG290A
	2SA564A-R(CU)	405 004 3208	ECG290A
	2SA608-F-CTV-NP	405 004 4809	ECG290A

 # For SAFETY use only equivalent replacement part.

AUDIO SCHEMATIC



ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2F

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®

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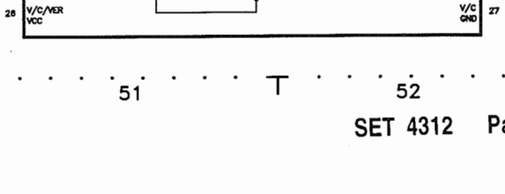
IC FUNCTIONS

IC101
LA76170N



PARTS LIST continued

SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.
Q701, 03, 05	2SC2621-E-RA	405 041 6705	ECG157
	2SC2621-C-RA	405 066 4304	ECG157
	2SC2621-D-RA	405 041 6507	ECG157
	2SC2688(1)-K	405 066 9903	ECG157
	2SC2688(1)-L	405 067 0008	ECG157
	2SC2688(1)-M	405 067 0107	ECG157
	2SC3620(LB-SAN-1)	406 000 3605	ECG157
Q721, 831	2SA1015-GR(SAN)	406 000 6804	ECG290A
	2SA1015-O(SAN)	405 001 7407	ECG290A
	2SA1015-Y(SAN)	405 001 7605	ECG290A
	2SA564A-Q(CU)	405 004 3109	ECG290A
	2SA564A-R(CU)	405 004 3208	ECG290A
	2SA933S-Q	405 006 1707	ECG290A
	2SA933S-R	405 006 1806	ECG290A
Q881, 82	2SC1740S-Q	405 011 8401	ECG85
	2SC1740S-R	405 011 8500	ECG85
	2SC1740S-S	405 011 8609	ECG85
	2SC1815-GR	405 012 2002	ECG85
	2SC1815-O	405 012 2101	ECG85
	2SC1815-Y	405 012 2309	ECG85
	2SC945A-PA	405 020 7501	ECG85
	2SC945A-QA	405 020 7709	ECG85
	2SC945A-RA	405 020 7907	ECG85
Q1015, 71, 93	2SC1740S-Q	405 011 8401	ECG85
	2SC1740S-R	405 011 8500	ECG85
	2SC1740S-S	405 011 8609	ECG85
	2SC1815-GR	405 012 2002	ECG85
	2SC1815-O	405 012 2101	ECG85
	2SC1815-Y	405 012 2309	ECG85
	2SC945A-PA	405 020 7501	ECG85
	2SC945A-QA	405 020 7709	ECG85
	2SC945A-RA	405 020 7907	ECG85
Q1094	2SA1015-GR(SAN)	406 000 6804	ECG290A
	2SA1015-O(SAN)	405 001 7407	ECG290A
	2SA1015-Y(SAN)	405 001 7605	ECG290A
	2SA564A-Q(CU)	405 004 3109	ECG290A
	2SA564A-R(CU)	405 004 3208	ECG290A
	2SA933S-Q	405 006 1707	ECG290A
	2SA933S-R	405 006 1806	ECG290A
Q1096	2SC1740S-Q	405 011 8401	ECG85
	2SC1740S-R	405 011 8500	ECG85
	2SC1740S-S	405 011 8609	ECG85
	2SC1815-GR	405 012 2002	ECG85
	2SC1815-O	405 012 2101	ECG85
	2SC1815-Y	405 012 2309	ECG85
	2SC945A-PA	405 020 7501	ECG85
	2SC945A-QA	405 020 7709	ECG85
	2SC945A-RA	405 020 7907	ECG85
Q8051	2SA1015-GR(SAN)	406 000 6804	ECG290A
	2SA1015-O(SAN)	405 001 7407	ECG290A
	2SA1015-Y(SAN)	405 001 7605	ECG290A
	2SA564A-Q(CU)	405 004 3109	ECG290A
	2SA564A-R(CU)	405 004 3208	ECG290A
	2SA933S-Q	405 006 1707	ECG290A
	2SA933S-R	405 006 1806	ECG290A

CAPACITORS & ELECTROLYTICS

	Item No.	Rating	Mfr. Part No.
#	**C410**	680pF 10% 3kV	403 324 3007
		680pF 10% 3kV	403 232 3403
#	**C412** (1)	.012 3% 1.5kV	404 066 4109
		.012 3% 1.5kV	404 079 1607
		.012 3% 1.5kV	403 343 7713
#	**C412** (2)	.011 3% 1.5kV	404 066 4000
		.011 3% 1.5kV	404 077 4006
		.011 3% 1.5kV	403 343 7614
#	**C416** (1)	.33 5% 200V	403 082 9818
#	**C416** (2)	.36 5% 200V	403 346 7324
		.36 5% 200V	403 216 7611
#	**C473**	.47 5% 63V	403 166 7716
		.47 5% 50V	403 067 7805
	C493	2.2µF 20% 100V NP	404 056 5307
	C503	2.2µF 10% 50V	403 276 0208
#	**C601**	.22 20% 250VAC	404 071 2404
		.22 20% 275VAC	404 066 2204
#	**C608**	.0047 10% 1kV	403 247 5508
		.0047 10% 1kV	403 232 0600
#	**C625**	.0027 10% 1kV	403 232 0402
#	**C631**	.001 10% 125VAC	404 008 6604
		.001 20% 125VAC	404 046 5409
		.001 20% 250VAC	404 073 4000
#	**C632**	.0022 20% 125VAC	404 008 6802
		.0022 20% 125VAC	404 046 5003
		.0022 20% 250VAC	404 073 4604
#	**C708**	.001 +100%-0% 2kV	403 175 3419
		.001 +100%-0% 2kV	403 077 2807
	C808, 09	20pF 5% 50V NPO	403 017 0910
	C3406	4.7µF 20% 25V NP	403 166 1605
	C3412	3.3µF 10% 10V Tantalum	403 124 9213
	C3414	10µF 10% 10V Tantalum	403 299 1820

 # For SAFETY use only equivalent replacement part.
(1) Used in chassis 27890-00.
(2) Used in chassis 27890-01.

CONTROLS & RESISTORS

	Item No.	Function/Rating	Mfr. Part No.
#	**PS601**	3 Cold PTC	408 006 7304
#	**R101**	33 5% 1W	401 061 1706
#	**R310, 11**	47 5% 1/2W	401 010 2501
#	**R407**	6800 5% 2W	401 069 3702
#	**R411**	6.8 10% 7W Wirewound	402 068 5001
		6.8 10% 7W Wirewound	402 076 0401
	R616, 17	1500 2% 1/6W	401 025 1506
	R6122	2000 2% 1/6W	401 158 2708
#	**R418**	2700 5% 1/2W Nonflammable	401 009 1607
#	**R421**	1300 1% 1/6W	401 052 8608
#	**R422**	10K 1% 1/6W	401 052 6802
#	**R423**	3300 1% 1/6W	401 053 2605
#	**R481**	33 5% 1/2W Nonflammable	401 009 4905
#	**R482**	1 5% 1/4W Nonflammable	401 011 9004
#	**R483**	1 5% 1/2W Nonflammable	401 006 7701
#	**R486**	5.6 5% 2W	401 068 6209
#	**R489**	27 5% 1W	401 060 6405
	R492	33K 1% 1/6W	401 156 8504
#	**R497** (1)	2.2 5% 1W	401 059 9608
#	**R497** (2)	1 5% 1W	401 057 8009
#	**R498**	8.2 5% 1/2W	401 011 4306
#	**R511**	270 5% 1W	401 060 7402
#	**R601**	1 10% 7W Wirewound	402 064 2905
		1 10% 7W Wirewound	402 072 3000
#	**R602**	3.3M 10% 1/2W	402 000 0705
#	**R604**	12 5% 2W	401 065 1801
#	**R606**	10 5% 2W	401 064 6302
#	**R613, 18**	27 5% 2W	401 066 9103
#	**R630**	22K 5% 1W	401 060 5002
#	**R711, 12, 13**	12K 5% 2W	401 065 4604
	R3406	16.5 1% 1/16W	401 256 8008

 # For SAFETY use only equivalent replacement part.
(1) Used in chassis 27890-00.
(2) Used in chassis 27890-01.

COILS & TRANSFORMERS

	Item No.	Function/Rating	Mfr. Part No.
	L164	15µH	645 003 9713
		15µH	645 016 2657
	L166	33µH	645 003 9812
		33µH	645 016 2985
	L305	5.6µH	645 008 2894
		5.6µH	645 016 3104
	L306	22µH	645 003 9782
		22µH	645 016 2831
	L309	5.6µH	645 008 2894
		5.5µH	645 016 3104
	L310	Ferrite Bead	610 078 5946
	L312	5.6µH	645 008 2894
		5.6µH	645 016 3104
	L332	15µH	645 003 9713
		15µH	645 016 2657
	L341	8.2µH	645 008 2924
		8.2µH	645 016 3227
	L401	3.3µH	645 017 7675
	L402	Ferrite Bead	610 031 9998
#	**L413**	Horizontal Linearity	645 025 4413
		Horizontal Linearity	645 029 8042
	L601	Ferrite Bead	610 078 6820
	L602, 21	Ferrite Bead	610 078 5946
	L623, 25	Ferrite Bead	610 078 5946
	L800	Ferrite Bead	610 078 5946
	L801, 13, 14	5.6µH	645 008 2894
		5.6µH	645 016 3104
	L821, 51	5.6µH	645 008 2894
		5.6µH	645 016 3104
	L863	5.6µH	645 008 2894
		5.6µH	645 016 3104
	L881, 82	5.6µH	645 008 2894
		5.6µH	645 016 3104
#	**L901**	Degaussing	645 022 8711
#	**L902** (2)	Yoke Horiz 1.3mH Vert 16.8mH	
	L1901	5.6µH	645 008 2894
		5.6µH	645 016 3104
	L8006	5.6µH	645 008 2894
		5.6µH	645 016 3104
#	**LF601**	Line Filter	645 012 0589
		Line Filter	645 026 8274
	T131	SIF	645 027 6095
	T151	45.75MHz VCO	645 027 6088
#	**T401**	Horizontal Drive	610 000 1138
		Horizontal Drive	610 223 1663
#	**T402** (1)	Horizontal Output	645 032 8978
		Horizontal Output	645 018 9579
#	**T601**	Power	645 032 5151

 # For SAFETY use only equivalent replacement part.
(1) Screen and focus controls are part of T402.
(2) Bonded part of CRT.

MISCELLANEOUS

	Item No.	Description	Mfr. Part No.	Notes
#	**A101** (1)	Tuner	645 032 5632	UHF/VHF, 1AV4F1BAM0210
	A1901	Receiver	645 027 4213	Remote
#	**F601**	Fuse	423 018 8101	4Amp, 125V, Fast Acting
		Fuse	423 007 1601	4Amp, 125V, Fast Acting
		Fuse	423 007 1809	4Amp, 125V, Fast Acting
	F601A, B	Fuse Holder	645 000 5077	For F601
		Fuse Holder	645 016 0479	For F601
#	**K701A**	Socket	645 025 6103	CRT
	K1001, 02	Jack	645 032 1979	Assembly
	K1011	Jack	610 010 3665	Left Audio Output
	K1021	Jack	610 010 3672	Right Audio Output
	K1051	Socket	610 010 8295	S-Video
#	**Q900** (2)	CRT	414 010 3409	A68AJB82X04
#	**Q900** (3)	CRT	414 010 0903	A68LQT58X02
#	**RL601**	Relay	645 000 4155	Degaussing
		Relay	645 011 2713	Degaussing
		Relay	645 024 7828	Degaussing
		Relay	645 015 8629	Degaussing
		Relay	645 024 7767	Degaussing
	SP901, 02	Speaker	645 005 6536	3" Square, 8 Ohms, 2W
	SW1901	Switch	645 027 7382	Power
	SW1902	Switch	645 027 7382	Volume Up
	SW1903	Switch	645 027 7382	Volume Down
	SW1904	Switch	645 027 7382	Channel Up
	SW1905	Switch	645 027 7382	Channel Down
	SW1906	Switch	645 027 7382	Menu
#	**W601**	Line Cord	645 030 5306	AC, Polarized
	X141	Filter	421 006 3206	SAW
	X153	Filter	610 015 2946	4.5MHz
		Filter	645 030 1049	4.5MHz
	X161	Trap	610 015 3059	4.5MHz
	X251	Crystal	610 204 4195	3.58MHz
		Crystal	610 245 9746	3.58MHz
		Crystal	610 012 0655	3.58MHz
	X401	Crystal	645 020 9147	507.5kHz
	X801	Resonator	645 026 8434	8MHz
	X8002, 03	Crystal	610 234 9085	-
		PC Board	610 276 0125	AV
		PC Board	610 275 9808	CRT
		PC Board (2)	610 276 0071	Main
		PC Board (3)	610 280 2535	Main
		Transmitter	645 032 6219	Remote, FXPT

 # For SAFETY use only equivalent replacement part.
(1) Contact TNI Electronics for replacement; order by manufacturer's part number.
(2) Used in chassis 27890-00.
(3) Used in chassis 27890-01.

CABINET PARTS

Item	Mfr. Part No.
Model DS27890	
Badge (SANYO)	610 236 9274
Button Unit	610 257 8614
Cabinet Front Assembly	610 271 9031
Cabinet Rear	610 266 9244
Dec AV Sheet	610 278 5678
Remote Transmitter	
Battery Cover	610 271 7143